Claims

We claim:

1) A method for introducing nucleic acid molecules into human beings and into non-human organisms comprising:
   c) Isolating and purifying RNA molecules;
   d) Incubating the RNA molecules with sperm cells;
   e) Fertilizing eggs with the sperm cells;
   f) Implanting the eggs or embryos derived from eggs into the appropriate host species and generating offspring; and
   g) Identifying offspring expressing the desired traits of the introduced genes.

2) The method of claim 1, in which the RNA is derived from a retrovirus, a retro-transposon, or a retro-vector.
3) The method of claim 1, in which the RNA is derived from a cell or cells expressing the RNA as cellular, viral, or vector RNA.
4) The method of claim 1, in which a cell extract containing RNA or intracisternal virus-like particles is used in place of purified RNA molecules.
5) The method of claim 1, in which a cellular RNA is used.
6) The method of claim 1, in which the RNA contains a viral or retro-viral packaging signal.
7) The method of claim 1, in which the RNA contains viral integration sequences.
8) The method of claim 1, in which the RNA contains retroviral or retrotransposon long terminal repeats (LTRs).
9) The method of claim 1, in which the RNA molecule(s) are derived from in vitro-transcribed RNA, such as T7 or SP6 polymerase-derived RNA.
10) The method of claim 1, in which the resulting transgenic organisms are used for agricultural or biotechnological purposes.
11) The method of claim 1, in which the resulting organisms are used to produce proteins, polypeptides, antibodies, cytokines, hormones or antigens.
12) The method of claim 1, in which the resulting transgenic organisms are used to make nucleic acid molecules, RNA, DNA, anti-sense nucleic acid molecules, vectors (as RNA, DNA or virus particles) or triple helix nucleic acid molecules.
13) The method of claim 1, in which the resulting transgenic organisms are used to make proteins secreted as milk proteins or as egg proteins.
14) The method of claim 1, wherein artificial insemination is used in place of in vitro fertilization.
15) The method of claim 1, used to treat or to prevent a disease or to impart a different genotype or phenotype in a human being.
16) The method of claim 1, used to treat a disease or to impart a different phenotype in a human being, wherein the genes are transmitted episomally so as not to alter the germ line.
17) The method of claim 1, wherein the transmitted foreign genes further comprise a suicide gene, so as to permit removal of the transgene from the affected cells at a later time.

18) The composition of matter comprising at least one retrovirus-derived or retrovirus transposon-derived ribonucleic acid preparation, comprising at least: a) retroviral or retrovirus transposon long terminal repeats; b) reverse transcriptase primer binding sites; c) a retrovirus packaging signal; and d) at least one foreign gene, whereby the ribonucleic acid preparation enables reverse transcription and perpetuation of the RNA as DNA in a transgenic organism.

19) A method of gene transfer comprising:
a) generating an organism bearing foreign genes by the method of claims 1;
b) preparing a cell extract, virus preparation or RNA preparation from cells, organs, embryos or tissues of the organism;
c) incubating the extract with cells, tissues, or organs of another origin;
d) selecting for the expression of the transferred foreign gene(s) in the recipient cells.